

ASAULYUK, 2.; KLOCHKO, I., kand.sel'skokhoz.nauk

Simmenthal cattle on the Trostyanets' State Farm. Nauka i zhittia  
11 no.10:29-30 0 '61. (MIRA 15:1)

1. Direktor plemzavodu "Trostyanets'" (for Asaulyuk).  
(Ukraine--Simmenthal cattle)

KLOCHKO, I. F.

Acidproof storage for hydrochloric acid. Sakh.prom. 31 no.7:34-36  
Jl '57. (MLRA 10:8)

1. Khodorovskiy sakharney zavod.  
(Hydrochloric acid--Storage)

**KLOCHKO**  
**KLOCHKO, I.F.**

Machining curved grooves on screw-cutting lathes. Sakb.prom.31  
no.9:35-36 8 '57. (MIRA 10:12)

1. Khodorovskiy sakharney zavod.  
(Sugar industry--Equipment and supplies) (Screw--Cutting machines)

OSOKIN, Grigoriy Alekseyevich; KLOCHKO, I.K., red.; DUKHNO, V.I.,  
tekhn. red.

[In one line] Edinye stroem. Krasnodar, Krasnodarskoe  
knizhnoe izd-vo, 1961. 23 p. (MIRA 16:10)

1. Starshiy operator, rukovoditel' vakhty kommunisticheskogo truda Tuapsinskogo neftefabrika, Tuapse (for Osokin).  
(Krasnodar Territory--Petroleum industry)  
(Socialist competition)

KRAILENKO, V.T.; KLOCHKO, I.K.; LAPIDUS, M.A., red.

[Fattening on a commercial basis] Utkorm na promyshlennoi  
osnove. Moskva, Kolos, 1965. 26 p. (MIRA 18:7)

K. CHAY, I. M.; SOLOV'YEV, S. Y.

Dairy Cattle

Results of efforts to build up a highly productive herd of cows Sov. zootekh. 7 no. 7, 1952. Kandidat Sel'skokhozyaystvennykh Nauk Ukrainskiy Nauchno-Issledovatel'skiy Institut Zhivotnovodstva

SO: Monthly List of Russian Accessions, Library of Congress, September 1952 1953, Uncl.

K. CHAY, I. M.

Razdoy Korov v Kolkhozakh i Sovkhozakh Ukrainy (The increased Milk Yield of Cows in Collective Farms and State Farms of the Ukraine) 2. Izd. Moskva, Sel'Khozgiz, 1953.

pl n. illus., Tables.

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КЛОЧКО, I. M.

Razdoi korov v kolkhozakh i sovkhovakh Ukrainy [Increasing the milk yield of cows on Ukrainian collective and state farms]. Moskva, Sel'khozgiz, 1954. 96 p.

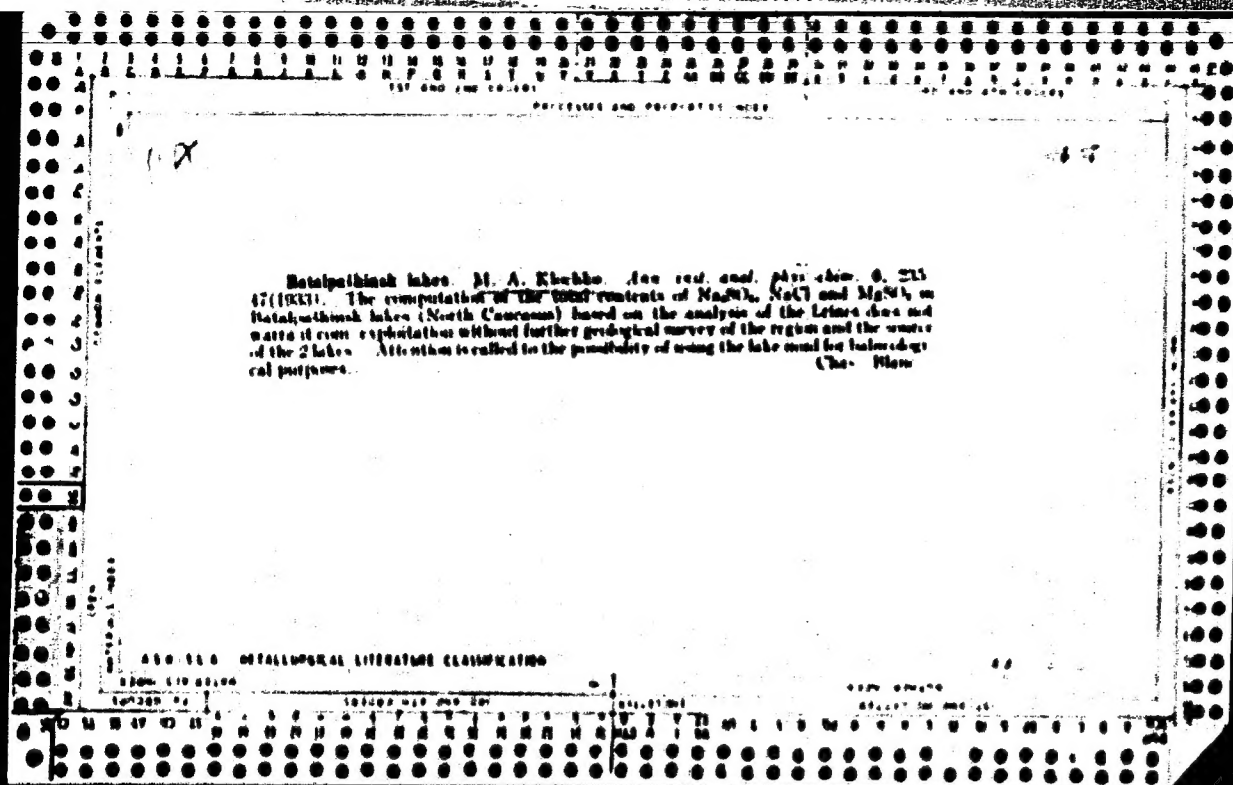
SO: Monthly List of Russian Accessions, Vol. 7, No. 3, June 1954.

KLOCHKO, I.P.; CHEBOTKOV, I.P., starshiy nauchnyy sotrudnik

Directed boreholes in steeply dipping seams dangerous  
as to sudden outbursts. Ugol' Ukr. 6 no.8:42-43  
Ag '62. (MIRA 15:11)

1. Glavnyy geolog Gosudarstvennogo tresta ugol'nykh  
predpriyatiy Kalininskoy oblasti kombinata Tulaugol'  
(for Klochko). 2. Donetskoy nauchno-issledovatel'skiy  
ugol'nyy institut (for Chebotkov).

(Boring)  
(Coal mining machinery)



KLOCHKO, M. A.

Double decomposition in the absence of a solvent, XXIV,  
J. Gen. Chem. Russ, 1933, 1026-1039, No. 3

The equilibrium relations in the system  $2LiCl + Na_2SO_4 \rightleftharpoons 2NaCl + Li_2SO_4$   
are discussed.

Electrochemical production of light metals from aqueous solutions. I. Preliminary experiments on the electrolysis of salts of the alkali metals. S. A. Krichen, *J. Appl. Phys.* (U. S. S. R.) 9, 420-421 (1968). *Trans. Faraday Soc.* 1967, 1, 2408-1; cf. C. A. 38, 4210. In order to overcome the difficulties encountered in the electrolysis of fused salts (high temps.) and of mol. solns. (impurities), the electrolysis of certain metals in the free state was investigated with complex compounds as electrolytes. Salts of the bromides or chlorides of the alkali metals and  $AlH_3$  or  $AlH_2$  in  $PhNH_2$  were used as complex compounds. The bromide of the alkali metal (or the chloride) was previously fused with  $AlH_3$  (or  $AlH_2$ ) and the fused mass dissolved in  $PhNH_2$ . The complex bromides and chlorides of the alkali metals are used in  $PhNH_2$ . By this method Li, Na, K and Rb can be deposited on the cathode from bromide solns. and Li and Na from chloride solns. A low c. d. and the use of a diaphragm increase the yield of the metal. The yield of Li on a current consumed reaches 25%, and in individual cases 100%. In the electrolysis the alkali metal moves as the reducing cation while the Al appears in the complex anion. The reaction scheme may be represented as follows:  $KAlH_2 \rightarrow K^+ + AlH_2^-$ ;  $AlH_2^- + e \rightarrow AlH_2$ ;  $AlH_2 + H_2 \rightarrow AlH_3$ . When a Ag electrode is used, the  $H_2$  combines with it to form  $Ag_2H_2$ ; when a Pt electrode is used, it flows in a thin stream to the bottom of the beaker. The  $AlH_3$  becomes coated in the anodic compartment. The espil. decompos. potentials for the alkali metals correspond to the calcd. values. M. G. Moore

**Theory of physicochemical analysis. 3. Investigation of nonequilibrium solutions by methods of physicochemical analysis.** M. A. Kabanov. *Dokl. akad. nat. i. in. S. S. S. R.*, 1949, No. 10, 1732-1734, 1735. (English.) 235. Thermodynamic analysis consists first with a study of the dependence of various properties of systems in their equilibrium on their composition and conditions of equilibrium as well as with the derivation of various generalizations and relations. Such properties may be divided into kinetic criteria and mechanical functions. The rate of change of an equilibrium system from one stationary condition to equilibrium and vice versa accelerates the consideration of a lot of properties including time (the so-called kinetic properties), such as rate of reaction, induction, transport, transition from one state to another, etc. Such properties, as a theory of physicochemical analysis, consider the connections resulting from the generalization method with the principal theories of the kinetic theory of matter. A study of the mech. properties of systems and comparison with other energetic and kinetic properties makes it possible to solve the question regarding the causes of the "unreliability" of one or the other property. Each point of an equilibrium change is connected with its surroundings by the principle of conservation. The properties of the surroundings may be used to obtain a general idea of the properties of any

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Investigation of nonequilibrium solutions by methods of physicochemical analysis. II. Electrical conductivity, viscosity and specific gravity of the binary system aluminum bromide nitrobenzene. M. A. Kiselev, *Dokl. Akad. Nauk S.S.S.R.*, 1957, 161, 711; English 672-3; cf. C. A. 51, 8240d. The elec. cond., viscosity and sp. gr. of various mixtures of the binary system  $AlBr_3-Al_2N_3$  from 0 to 100%  $Al_2N_3$  at temps. from 6° to 100° were determined. The properties of the condensed phase, but not those of the  $Al_2N_3$  phase through which it was, at a temp. that rises in accord with the higher content of nit. in solution (these depend on the temp.). The features of the condensed phase, and the features of the system and are displaced with temp. in the direction of  $Al_2N_3$ . The latter corresponds to the composition of the condensed  $AlBr_3-Al_2N_3$  and is not displaced with temp. (angular rule). The properties of viscosity have breaks (where the fall in viscosity is retarded, during down the temp.) which are in a temp. corresponding to the breaks of the condensed phase, and the condensed phase, polythene. The viscosity increases with the temp. and the breaks in the condensed phase, and during it at single points corresponding with the composition of the condensed phase. The breaks on the viscosity increases correspond roughly to the composition of the condensed phase. The temp. cond. curves are similar for viscosity and elec. cond. and, being heated on either side from the axis of abscissas, form a mirror reflection of each other; they form a max. corresponding to the composition of the condensed phase. The features of sp. gr. correspond

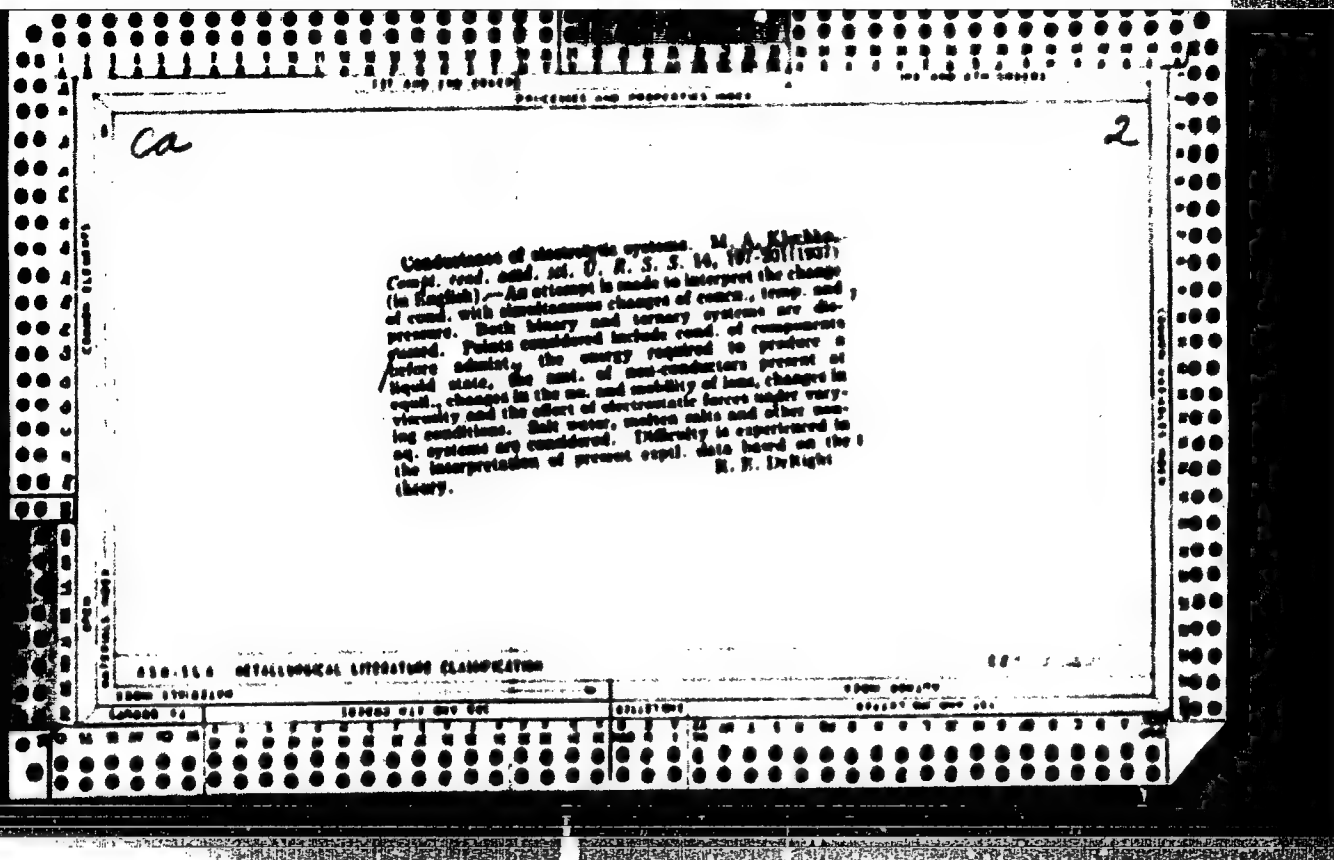
a straight line running under very obtuse angles with points, the abscissas of which correspond to composition of the condensed phase. The temp. cond. of sp. gr. changes very little with temp. or composition, whereas the content of the condensed phase on the other properties decreases sharply with temp. the content of  $Al_2N_3$  in solution. The results of this research, similar to those of other studies of electrolyte systems, are not to be explained from the viewpoint of the usual conceptions of the theory of electrolyte solutions, that is, of the existence of some sort of "chemical interaction" of the solvent and of the condensed phase, as well as the changes in the properties that depend on variation of the composition of the system, and also the relation of the condensed phase to the changes in viscosity of the system, can be interpreted only when based on the following conceptions: 1) complete absence of electrolyte interaction independent of its composition; 2) the decisive part played by the individual inherent properties of the components of the system and of their composition; and, 3) dependence of the conductivity of the system on changes in viscosity of the system. In the system  $AlBr_3-Al_2N_3$ , the components of which individually are practically nonconductive, the electrolyte is represented by the complex that they form  $AlBr_3-Al_2N_3$ , and is distinguished by a substantial thermal discharge and cond. of current, in the liquid state. Following

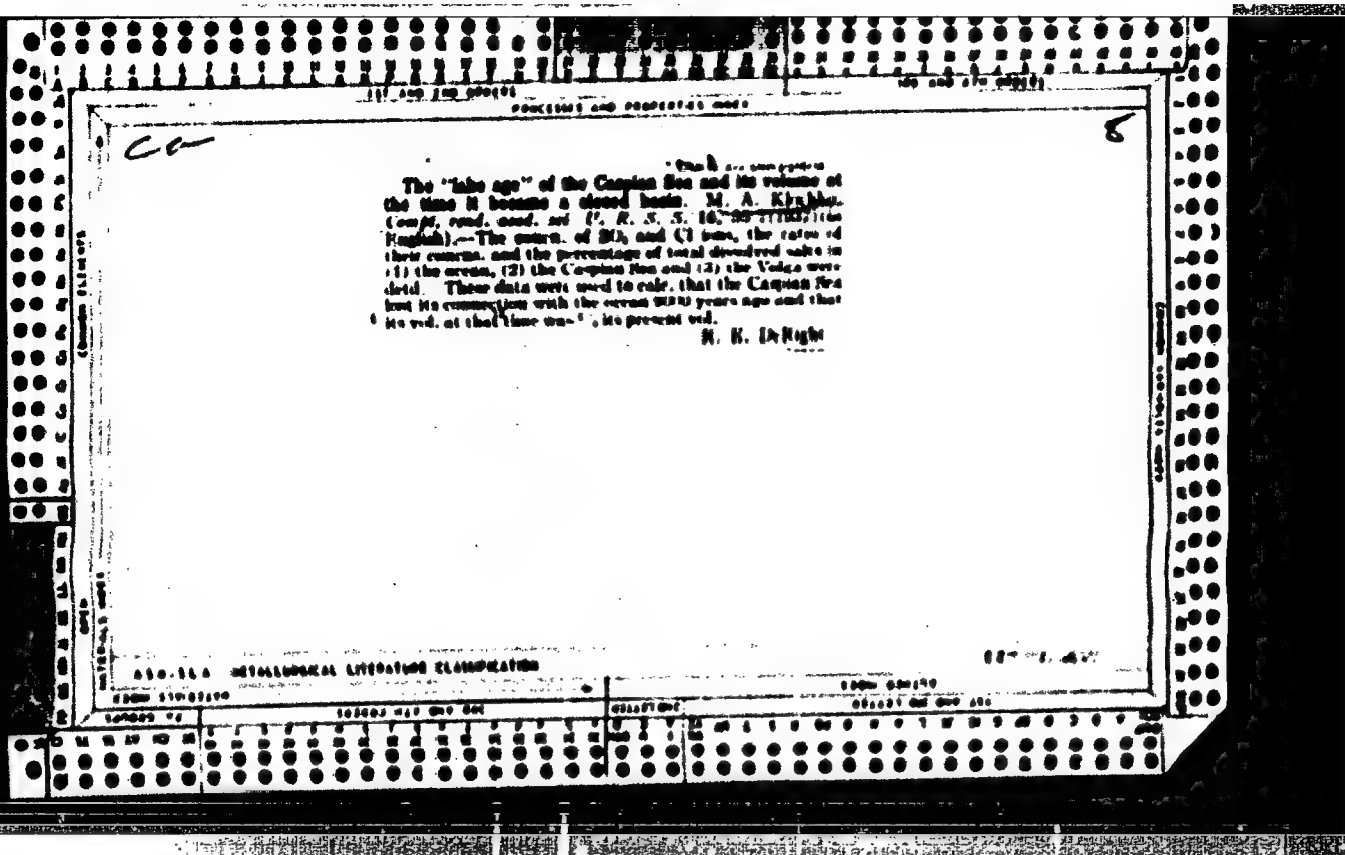
on increase in temp. this comp. disintegrates into non-  
conductive (or poorly conductive) constituents, which is  
indicated by the rapid fall in elec. cond. In time at temp.  
approaching the point of solidification and decrease of  
the cond. When added in a surplus quantity to the given  
comp. each of the components of the system having its  
fusion temp. transformed it into a liquid state or greatly  
reduced its viscosity; different compounds, therefore, pro-  
duce greater elec. cond. But as a result of the decrease of  
this comp. following an increase of temp. the temp.  
coeff. of elec. cond. is not in all cases in which a decrease  
in viscosity with temp. this is not very great, and by in-  
creasing the heat conductivity, does not overlap the decrease  
in elec. cond. which follows as a result of the temp. de-  
crease of the conductive comp. W. A. Cook

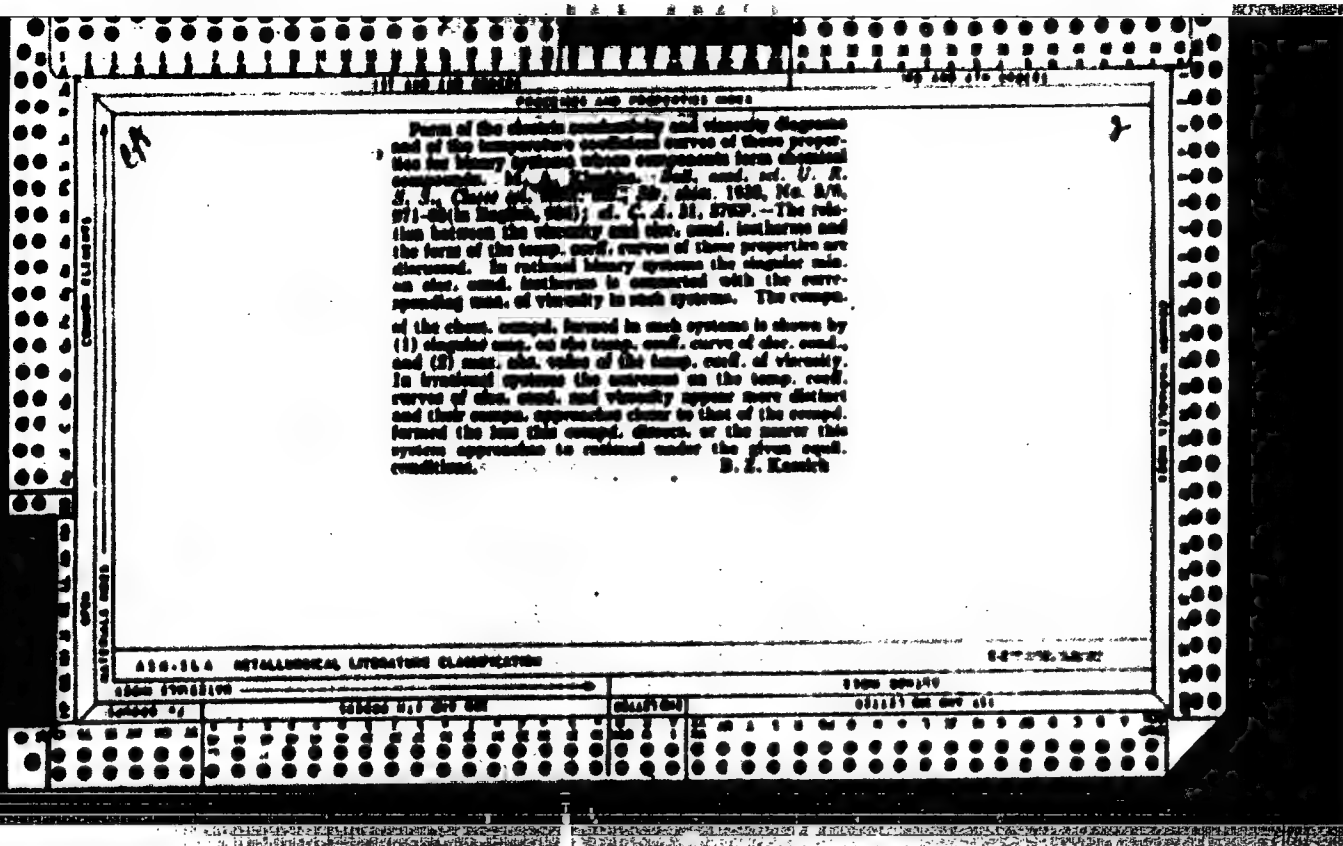
18

Resources of salts in H Van Lake and their utilization  
M. A. Klyukhin. *J. Applied Chem.* (U. S. S. R.) 10.  
228-231 (1937).--The resources of the  
above lake are described and a simple method of their  
approx. evaluation is given. An isothermal evaporation of the  
H Van lake brine yields a NaCl ppt. and a MgCl<sub>2</sub>-acid.  
sols. Freezing out the brine yields a NaCl and Na<sub>2</sub>SO<sub>4</sub>.  
241.0 ppt. Twenty-three references. A. A. P.

ASSOCIATED METALLURGICAL LITERATURE CLASSIFICATION



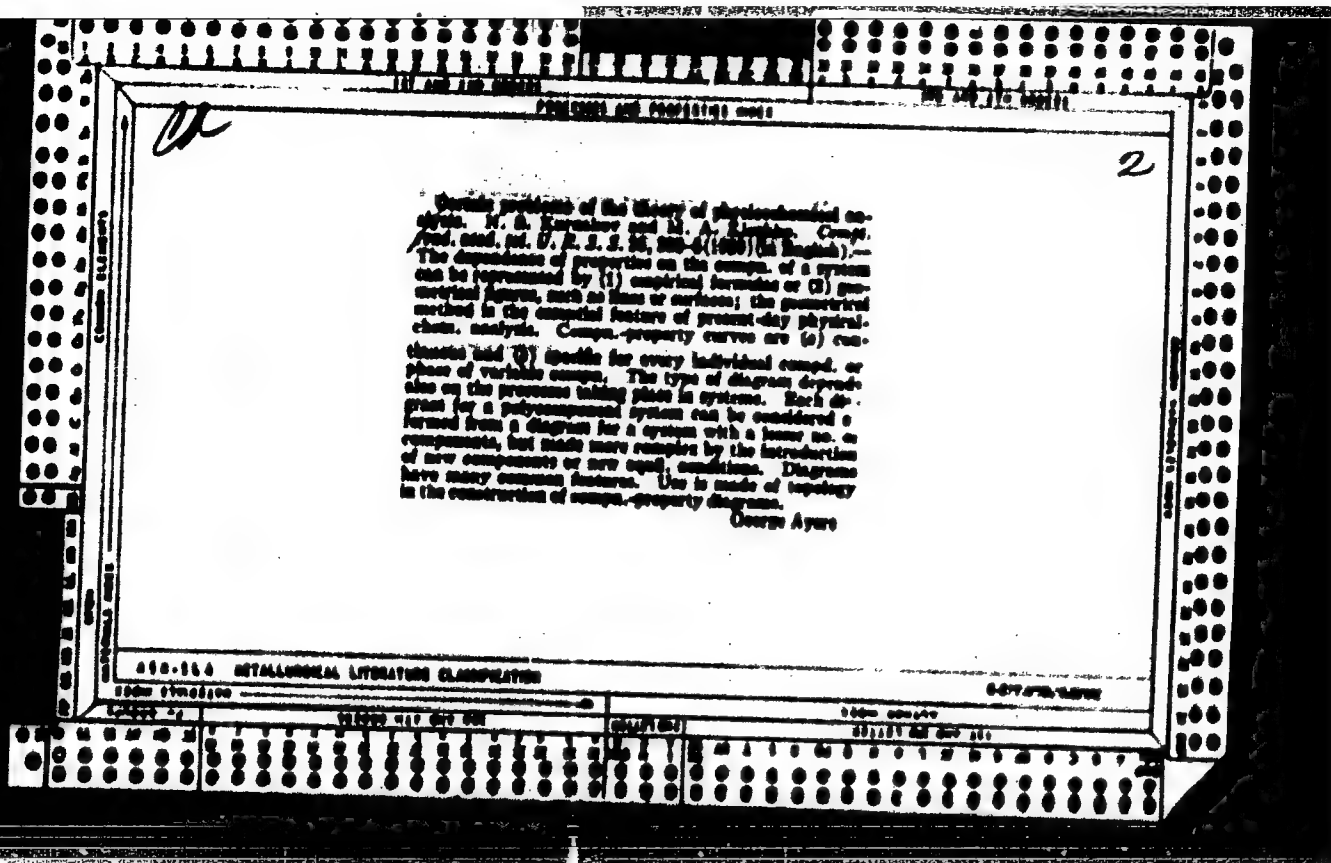




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const. ratio of benzidine has varying concs. of  $\text{PbNO}_3$ . At a const.  $\text{KBr}$  content the isotherms of  $\eta$  show a sharp max. while obs. cond. shows a min., both points corresponding to equivalent ratio of  $\text{AlBr}_3/\text{PbNO}_3$ . The observed  $\eta$  in this system is  $\text{KBr} \cdot \text{AlBr}_3$ , which in min. shows some complex ions. Cond. of  $\text{KBr} \cdot \text{AlBr}_3$  depends both upon the solvent but it is decreased by  $\text{AlBr}_3$ ,  $\text{PbNO}_3$ . At low temp. and high concn. of  $\text{AlBr}_3$  the cond. is very small on account of the great  $\eta$  and the effect of the  $\text{KBr}$  upon the cond. is not large.  $\eta$  depends upon  $\text{AlBr}_3$ ,  $\text{PbNO}_3$ . The effect of temp. upon the obs. cond. and the fluidity is the same: both increase with rising temp., the polythene of each property diverging, but upon decreasing the temp. the polythene converge at one point ( $10^\circ$ ). The isotherms of sp. gr. at a const.  $\text{KBr}$  content show a small break at 40-50 and.  $\% \text{AlBr}_3$ . The polythene are nearly straight lines. S. S. Kozich



Ca

The electric-conductivity isotherms of two-component liquid systems. M. A. Kharin. *Sov. and. sci. U. R. S. S., (USSR AC. 7010: 1968, 120-40 (in English, 600)).* - Two-component liquid systems are classified as follows: (1) both components are nonconducting and form no compounds; their cond. isotherms coincide with the compound (AlBr<sub>3</sub>-AsBr<sub>3</sub>); (2) the cond. increases uniformly from the nonconducting to the conducting component (AlBr<sub>3</sub>-conducting salt, NaBr-conducting salt); (3) the cond. increases from the nonconducting to the more conducting component (KCl-NaCl); (4) a non-conducting compound is formed which does not change the cond. of the system composed of nonconducting components; (5) a combination of types 1 and 2; (6) 2 diagrams of type 2; (7), (8) and (9) other combinations of the first 4 types. Besides these 9 types there are considered 12 derived types which represent the 9 fundamental types in which the effect of the  $\alpha$  is considered. The fundamental types predominate at temps. far removed from the m. p. of the components as in the presence of a 3rd indifferent component. In these cases the effect of the  $\alpha$  is not important. In deriving these types it was assumed that the degree of electrolytic dissociation is independent of the concentration. Therefore, their application to real systems shows that the degree of dissociation does not increase with dilution. The group of systems composed of weak electrolytes and water is an

exception. Their cond. isotherms deviate frequently from the typical isotherms. The cond. isotherms of all other systems (fused salts, aq. and aprotic, conducting salts, and systems in which chem. compounds are formed) can be explained qualitatively on the basis of the types derived in the paper. Three factors affect the character of the change of the cond. with the comp.: (1) the relative values of the cond. of the components of the system in the individual liquid state and of chem. compounds formed in this system; (2) the nature of the interaction between the components of the system; (3) the nature of the change of the  $\alpha$  isotherms in the system. 43 references. W. R. Mann

400.55 METALLURGICAL LITERATURE CLASSIFICATION

U. S. DEPT. OF COMMERCE

KLOCHKO, M. A. and MEDVEDEVA, Z. S.

"Use of Palladium for Electroplating." J. Appl. Chem. Russ., 1942, 15, 25-46.

Bright adherent coatings of Pd cannot be electrodeposited on Fe or Al cathodes. Those forming on Cu cathodes from electrolytes of the type  $R_2PdCl_4 \cdot nH_2O$  ( $R = H, NH_4, Na, \text{ or } K$ ) are uneven and discoloured, and non-adherent when thicker than  $0.1 \mu$ . This is ascribed to a cementation process, involving replacement of Cu by Pd, and proceeding even during passage of current. Better results were obtained with the electrolyte 2.5% aq.  $Na_2Pd(NO_3)_4$  in 3% aq. NaCl (Pd anode, c.d.  $\approx 1 \text{ ma./cm.}^2$ , at  $40^\circ$ ), but the thickness of the coating was  $\approx 1 \mu$ , and the process is slow. Of a no. of other electrolytes tested, the best results were given by that recommended by Zvyagintsev et al (B., 1939, 535), containing  $Pd(NH_4)_2(NO_3)_4$ .

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*M*

Electrochemical Production and Refining of Platinum-Group Metals. M. A. Khrushin and E. N. Medvedeva (Zhur. Priklad. Khim., 1962, 15, (11), 71-76; Zhur. Priklad. Khim., 1968, (11), 179).—A review.

ASAC-USA METALLURGICAL LITERATURE CLASSIFICATION

KLOCHKO, M. A. and MEDVEDEVA, Z. S.

"Electrochemical deposition of tin from solutions of tin compounds."  
J. Appl. Chem. Russ., 1942, 15, 120-127.

Sn can be recovered from solutions of  $\text{SnCl}_4$  in aq. HCl (10-140g. of HCl/l.) by electrolysis with Fe anodes in presence of  $\sim 2$ g. of glue per l., the cathodic c.d. being 300 amp./m.<sup>2</sup>. The  $\text{Sn}$  can be reduced from, e. g., 115 to 6 g./l. with a current yield of  $\sim 100\%$ . Electrolysis of  $\text{SnCl}_4$  + HCl with a C anode gives low yields ( $< 40\%$ ) of Sn. Electrolysis of  $\text{SnCl}_4$  solutions in 2.8% NaOH + 3% NaOAc at cathodic c.d. of 300 amp./m.<sup>2</sup> gave high current yields but only  $\sim \frac{1}{2}$  of the original Sn was then deposited.

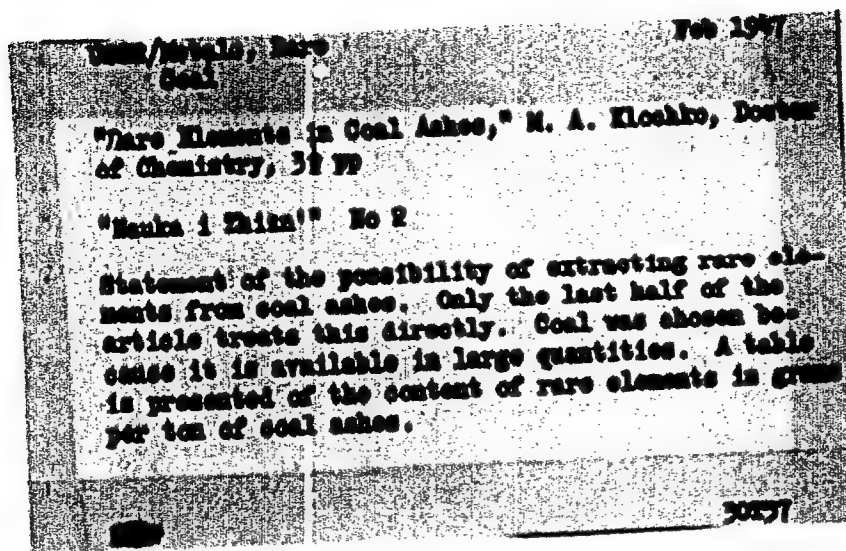
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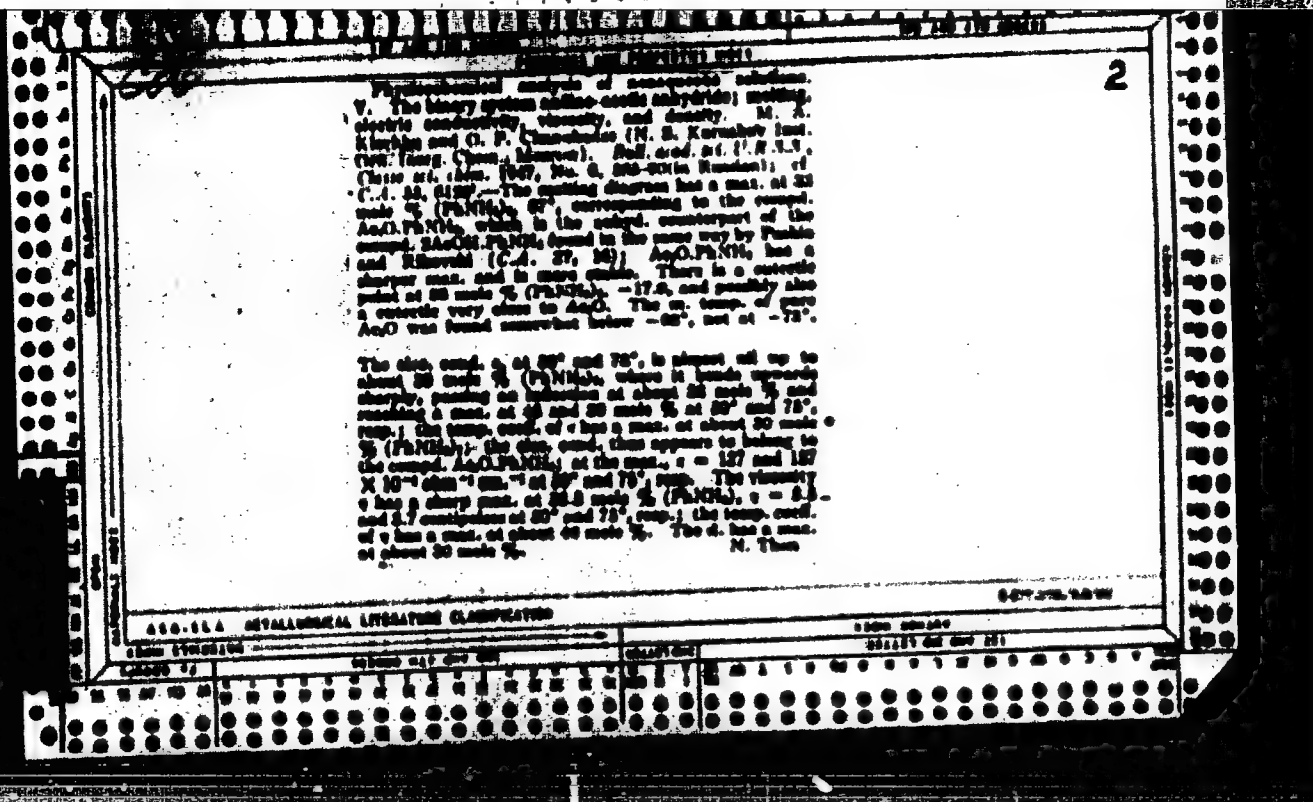
REPRODUCING WITH PD AND PT. M. A. Kuchko and  
S. M. Kuchko. Ann. entom. soc. Ind. chm.  
soc. (U. S. S. R.) No. 10, 100-105 (1968).--Review with  
an abstract. A short section on Rh-plating is included  
M. M. Lehtinen

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ASB-513 R000723210006-0

KLOCHKO, M. A.





KLOCHKO, M. A.

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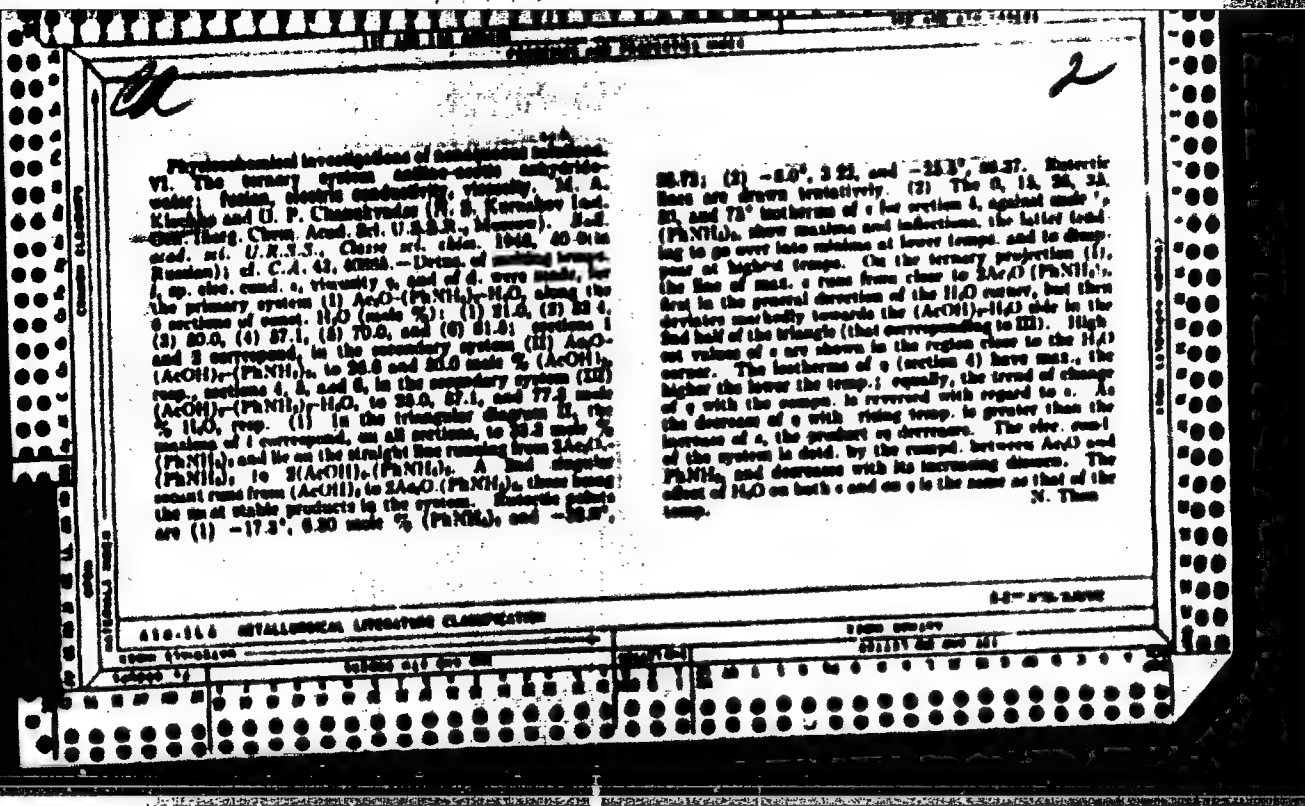
USSR/Chemistry - Systems, Ternary Jan/Feb 1948  
Chemistry - Conductivity, Electric

"Investigation of Anhydrous Solutions by Physical  
Chemical Analysis, Part III: Triple System,  
Aniline - Acetic Anhydride - Water; Fusibility,  
Conductivity, Viscosity," M. A. Klochko, O. P.  
Chernukvadze, Inst of Gen and Inorg Chem, Acad  
Sci USSR, 9 pp

"Is Ak Nauk SSSR, Otdel Khim Nauk" No 1

Describes study of electroconductivity and viscosity  
at temperatures of 0°-75°, and also of fusibility  
in triple system, aniline - acetic anhydride -  
water.

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Analogy between phase rule and the Euler theorem for  
polyhedrons. M. A. Krasovskiy (M.S. Kurnakov Inst. of  
Chem. and Ind. Chem., Acad. Sci. U.S.S.R.). Dokl.  
Akad. Nauk S.S.S.R. 10, 22-4(1949).--The similarity  
between the phase rule equation and the Euler (Leonard)  
theorem in geometry is purely one of form based primarily  
on the similarity of certain algebraic groupings. M. Hersh

ANOSOV, Viktor Yakovlevich, professor, doktor khimicheskikh nauk; POGODIN, Sergey Aleksandrovich, professor, zaslushennyy deyatel' nauki i tekhniki REFER, doktor khimicheskikh nauk [authors]; VOL'FKOVICH, S.I., akademik; KLOCHKO, M.A., professor, doktor khimicheskikh nauk, laureat Stalinskoy premii [reviewers].

Second awarding of N.S.Kurnakov's prize ("Fundamentals of physicochemical analysis." V.I.Anosov, S.A.Pogodin. Reviewed by S.I.Vol'fkovich, M.A.Klochko). Izv.Sekt.fiz.-khim.anal. 21:5-9 '52. (MLRA 6:7)  
(Chemistry, Analytical) (Pogodin, Sergei Aleksandrovich)  
(Anosov, Viktor Yakovlevich, 1891- ) (Chemistry, Physical and theoretical)



KLOCHKO, M. A.

8

Electroconductivity and viscosity of the system lithium chloride-water. M. A. KLOCHKO, L. O. GIL'BERG (N. S. Kurnakov Inst. Chem. Phys., Acad. Sci. U.S.S.R., Moscow). *Izv. Akad. Nauk S.S.S.R. Khim., Akad. Nauk S.S.S.R. 11, 879-80 (1962).*  
This system was studied at LiCl concns. of 0-40.0 mol. % and 25, 50, 75, and 100°. The osmotic on the concn. curve shifted from 10.5 mol. % at 25° to 11.8 mol. % at 100°; the cryohydric point is at 11.8 mol. %. On approx. the same points on the viscosity curve a sharp rise started. The trihydrate was marked on the property curves either by breaks or bends. In aq. soln. the viscosity decreases from pure salt to pure H<sub>2</sub>O. It is also possible that the ions migrate under the influence of an e. field in a shell of H<sub>2</sub>O. The dimensions of this shell depend on the concn. considering that at a concn. of 50 mol. % 1 mol. of H<sub>2</sub>O is shared by 18 ions and only at 33.3 mol. % does each ion have a mol. of H<sub>2</sub>O. Pure fused LiCl at 250° had a cond. 0.80 ohm<sup>-1</sup>cm<sup>-1</sup> or twice the value of at 100°. M. Klovch

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KLOCHKO, M.A.

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Conductivity and viscosity of the system Nitric acid - Nitroethanol. M. A. Klochko and L. O. Gerasimov. N. S. Kurnakov Inst. of Inorganic Chem., Acad. Sci. USSR, Moscow, U.S.S.R. Zh. Fiz. Khim. 44, 1711-1712 (1970).—In this investigation the concn. of  $\text{LiNO}_3$  was 0-24.85 mol.%, and the temp. 0, 25, and 50°. The cond. curves had maxima that shifted toward higher concn. with the rise in temp. Thus, at 0° the max. coincided with 8 mol.% and at 50° with 8.8 mol.%. The viscosity curves rose gently at first and then sharply. Generally, the property curves of  $\text{LiNO}_3$  in MeOH resembled closely analogous curves in  $\text{H}_2\text{O}$  except for the numerical values of the resp. points. At 25° the cond. max. in  $\text{H}_2\text{O}$  coincided with 10.3 mol.%  $\text{LiNO}_3$ , and in MeOH with 8.2 mol.%. The abs. value of cond. at 2° and 50° in  $\text{H}_2\text{O}$  was 5.8-6.9 times the corresponding value in MeOH, whereas the viscosity in MeOH was only 1.34-1.35 times the corresponding value in  $\text{H}_2\text{O}$ . Apparently, the interaction of components in the 2 systems is quite different.

M. A. Klochko

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КЛОСНКО, М.В.

Properties of lithium alkylate solutions in equimolecular mixtures of water and dioxane. M. A. Krichen and I. G. Glushko (N. S. Kurnakov Inst. Chem. Technol. Chem. Acad. Sci. U.S.S.R., Moscow). Izv. Akad. Nauk S.S.S.R., 1960, No. 11, 2418-2420 (Engl. transl. Zh. Khim., 1960, No. 11, 2418-2420). Cont. viscosity, density, temp. temp., and on temp. of 0.50-3.40 mol % alkyl were studied in equimol. mixts. of H<sub>2</sub>O and dioxane at 15-75°. The vis. of the H<sub>2</sub>O-dioxane mixt. was  $2.17 \times 10^{-2}$ ,  $2.34 \times 10^{-2}$ , and  $2.48 \times 10^{-2}$  mpoise/cm. at 25, 50, and 75°, resp. The temp. of appearance of crystals rose with the LiNO<sub>3</sub> cont. H<sub>2</sub>O from 7.5° in soln. free of Li<sub>2</sub>CO<sub>3</sub> to 8.7° at 20.17 mol % of LiNO<sub>3</sub>. At 11 mol % there was a bend in the curve. The  $\eta$  at 20.17 mol % rose sharply to 1.45 mpoise. The LiNO<sub>3</sub> cont. at 25° was 24.41 mol %. No water-free soln. were recorded below 24.41 mol %. At 24.41 mol % the LiNO<sub>3</sub> cont. rose sharply to 28.21 mol % at 50° and 28.21 mol % at 75°. The LiNO<sub>3</sub> cont. rose from 7 to 28 mol % LiNO<sub>3</sub> with increasing temp. of a concn. entirely outside the liq. reg. (Fig. 1); (2) rose uniformly with temp. The

cond. polyetherim for 5.81 mol. %  $\text{LiNO}_3$  had a bend at a much lower  $\theta$ , where layer separation begins. The bend polyetherim for 11.39 mol. %  $\text{LiNO}_3$ , which compares, is entirely within the layer separation zone, but too far to the right and some sharply with trip. The cond. was detd. in the lower layer  $\theta$  which contained practically all of the  $\text{LiNO}_3$ . Cond. boundaries are drawn on the boundary of the layer type zone. Upon entering the layer sep. zone, some the cond. rose sharply and dropped upon emergence from it. The viscosity and  $d$  curves behaved in an analogous manner. For comparative means, of  $\text{LiNO}_3$  at 45° in  $\text{H}_2\text{O}$ ,  $\text{MeOH}$ , and  $\text{1,1,2,2-tetrafluoroethane}$  (1) the exp.  $d$  is for cond. ( $\alpha$ ), viscosity ( $\beta$ ), and temp.  $\theta$  of cond. ( $\gamma$ ) and of viscosity ( $\delta$ ) are: for 5.81 mol. %  $\text{LiNO}_3$  in  $\text{H}_2\text{O}$   $\alpha = 0.1639$  mho/cm,  $\beta = 1.48$  centipoise,  $\gamma = 1.435$ ,  $\delta = 1.818$  and  $\theta = 0.823^\circ\text{C}$ ; for 10.9 mol. %  $\text{LiNO}_3$  in  $\text{MeOH}$   $\alpha = 0.0920$  g = 0.957,  $\beta = 3.06$ ,  $\gamma = 1.760$ ,  $\delta = 1.9$ ,  $\theta = 1.200^\circ\text{C}$ ; for 8.61 mol. %  $\text{LiNO}_3$  in  $\text{1,1,2,2-tetrafluoroethane}$   $\alpha = 0.0048$  g = 2.704,  $\beta = 1.349$ ,  $\gamma = 2.103$ ,  $\delta = 1.9$ ,  $\theta = 1.200^\circ\text{C}$ . Qualitatively, the decrease in cond. can be explained by a decrease in the dielectric constant and a decrease in the permittivity of the 3 solvents.

**KLOCHKO, M.A.; LUNOVA, V.S.**

**Chemical and electrochemical dissolving of palladium in solutions  
of certain acids and salts, Izv.Sekt.plat.i blag.met. no.27:239-244  
'52.**

**(MLRA 7:5)**

**(Palladium) (Solubility)**

The effect of Karst tubes and Key on alteration of salt balance in the Canadian Sea. M. A. Kharin (Lobachevsky Inst. Acad. S.S.S.R. No. 1055 in 1967). From consideration of the known rate of flow of streams and rivers into the sea, and for the analysis of the mineral content of the water therein, the flow of 7 km. km. of Canadian waters into the bay would suffice to lower the chloride content and the mass of mineral salts so as to prevent accumulation of sulfates. In acting as a salt conveyor against the bay over the past 40 years sea-ice, to have reduced the salt content of the sea by 0.1%, so that the present salinity of 1.2%, would have been 1.1% had the bay been unenclosed. (Clearly speaking, however, the draining action of the bay is rather small, and is of interest mainly for theoretical considerations of establishment of salinity in connecting basins of water.)

(1) M. Kharin

ALCOCK, I.A.

USSR.

Relation between the composition of solutions electrical conductivity and that at the eutectic point in salt-water systems.

When the following rule is applied to binary systems salt-water the same relation passes through a point at which the composition coincides (within 1-2 mole %) with the composition at the eutectic, if the salt forms crystalline hydrates. If the salt does not form crystalline hydrates, these compositions do not coincide.

I. Kozlov Leningrad

KLOCHKO, M. A.

Physical Chemistry, Physicochemical Analysis (12494)

Izv. Sektora Fiz. - Khim. Analiza Inst. Obshch. i Neorgan. Khimii AN SSSR, Vol. 22, 1953  
pp 298-312

Klochko, M. A.; Uchurkhanov, E. M.

Investigation of the System Silver Perchlorate - Water by the Method of Physicochemical Analysis

Studied the above system and determined its electrical conductivity, density, viscosity, and other physical properties.

SO: Referativnyi Zhurnal -- Khimiya, No. 2, 1954 (W-30907)

KLOCHKO, M.A.; UCHUKHANOV, M.M.

Physicochemical study of the system silver perchlorate — acetone.  
Izv.Sekt.fiz.-khim.anal. 22:313-319 '53. (MLRA 7:5)

1. Institut obshchey i neorganicheskoy khimii im. N.S.Kurnakova  
Akademii nauk SSSR. (Silver perchlorate) (Acetone)

KLOCHKO, S. A.

3

Anodic behavior of silver-palladium alloys in  $NH_4NO_3$  solution.  
S. A. KLOCHKO and S. M. KOTLYAROVA. Izv. Akad. Nauk SSSR, 23, 131-4 (1953).  
Polarization curves were obtained for Ag, Pd, and 7 of their alloys contg. 10-75% Pd. As the potential of the external circuit rose, the anodic potential first changed rapidly without changing the current; then, as either the anode began to dissolve or  $O_2$  started to be evolved on it, the current rose sharply while the potential remained the same. The polarization curves formed 2 groups: (1) on Ag and alloys with up to 25% Pd, (2) Pd and alloys with more than 25% Pd. Alloys with up to 25% Pd dissolved in  $NH_4NO_3$  with current. Alloys with higher Pd content were passive. In the course of electrolysis an anodic sludge formed, the compn. of which was the same as that of the anode.

31. Hoveh

KLOCHKO M.A.

*Radiographic investigation of sludge from anodic solution of silver-palladium alloys in normal nitric acid.*

M. A. Klochko, A. N. Kharova, and I. S. Medvedeva.  
*Dokl. Akad. Nauk SSSR*, 1975, 231, 137-41 (1975). -- X-ray analysis of the anodic sludge formed during electrolytic dissolving of Ag-Pd alloys showed it to be the same solid sol as the anode from which they formed. The sludge forms as a result of uneven dissolving of the surface of the anode of which individual areas can have different electrode potentials. In the course of electrolysis these areas fall off the anode, forming the sludge.  
 M. Hosh

✓ Investigation of the silver-silver chloride system by  
the photochemical method of electrolysis

3 and 3.8 V. (current 2 v.). Electrolysis of soln. yields  
highly cryst. dull ppt. of Ag. F. S. Holz

PM  
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5(2)

SOV/78-4-8-41/43

AUTHOR:

Kloshko, M. A.

TITLE:

Symposium on the Chemistry of the Coordination Compounds in  
Agra (India) (Simposium po khimii koordinatsionnykh soyedineniy  
v g. Agra (Indiya))

PERIODICAL:

Zhurnal neorganicheskoy khimii, 1959, Vol. 4, Nr 8,  
pp 1937-1939. (USSR)

ABSTRACT:

The symposium took place in February 1959. The following  
scientists from the USSR attended the symposium: Academicians  
A. N. Tarenin and S. I. Vol'skovich, Ya. I. Gerasimov, Corresponding Mem-  
ber of the AS USSR, and M. A. Kloshko, A. S. Katal'nikova, M. N.  
Lyashenko, L. A. Nazareva, G. V. Shevchenko and Ye. V. Shen-  
dezetskaya, scientific collaborators of the Institut obshchey  
i neorganicheskoy khimii im. N. S. Kurnakova AN SSSR (Institute  
of General and Inorganic Chemistry imeni N. S. Kurnakov of  
the AS USSR). A report is given on the scientific institutes  
of India and the lectures heard. Eastern scientists delivered  
the following lectures: A. N. Tarenin: "Infrared Spectra of  
Molecular Compounds of Metallic Halides"; Ya. I. Gerasimov:  
"The Influence Exercised by the Crystal Structure on the Thermo-  
dynamical Properties of Tungstic Oxides With Variable

Card 1/2

SOV/78-4-8-41/43

Symposium on the Chemistry of the Coordination Compounds in Agra (India)

Coordination Number" and Doctor L. Sommer (Czechoslovakia) on the analytical application of some complex compounds of the polyphenols.

Card 2/2

*Klochkov M.A.*  
APPROVED FOR RELEASE: 06/19/2000 CIA-RDP86-00513R000723210006-0  
USSR / Theory of Solids. Geometrical Crystallography.

Abs Jour : Ref Zhur - Fizika, No 4, 1957, No 9154

Author : Klochkov, M.A.

Title : Connection Between the Coordination Numbers and Complex Compounds and the Number of Vertices of Regular Convex Polyhedra.

Orig Pub : Izv. Sektora platiny AN SSSR, 1955, vyp. 29, 133-140

Abstract : Starting with the assumption that the activity of the central atom in the complex is spherically symmetrical, the author calculates the possible coordinate numbers as the numbers of the vertices of regular convex polyhedra, inscribed in a sphere, in whose center the central atom (ion) is located. The fundamental coordination numbers are 4, 6, 8, 12 and 2. Coordination numbers 5, 7, 9, 10 and 11 have low probability, and are hardly ever observed in practice. The coordination number 3 corresponds to the placement of the substitutes in one plane.

Card : 1/1

✓ The anodic behavior and potentials of gold-silver  
alloys. M. A. Kuchko and V. K. Nikulina. *Electrochim. Acta*, 1971, 16, 1001.  
Norsk. Kjem. Abt. Nord. S.S.R. 29 197 2nd 1971.  
The anodic and cathodic and the electrode potentials  
of the Au-Ag system were studied over the whole composition  
range and in the anodic as well as cathodic regions. The  
nature of the anodic potential curve in the anodic and the  
cathodic regions was ambiguous and it was found that  
the degree of the anodic and cathodic reactions  
increased. The straight line curve of the  
anodic reaction in terms of the standard  
thermodynamic range. In the anodic region, the anodic  
curve in Au was the 1st to diffuse. The standard  
thermodynamic range had the anodic curve  
the anodic curve in Au was the 1st to diffuse.

1600

SECRET - This report contains information of a confidential nature and is to be controlled by the same procedures as the original. It is to be destroyed when the original is destroyed.

1. The following information was obtained from the files of the Agency of the Ministry of Defense, the last report in the series was dated 10/1/60 and the last report in the series was dated 10/1/60 and the last report in the series was dated 10/1/60.

*[Handwritten signature]*

ROBERTO, F. A.

2 3

Study of energy collection alloys by electrochemical methods. M. A. Kuchin and M. B. Mironova. *Invent. Zhurnal Fiz. Khim. i Metal. Akad. Nauk S.S.S.R.* 23, 118-20 (1963).—Cu-Pd alloys with 0-100% Pd were prep'd from electrolytic Cu and sponge Pd. Impurities did not exceed 0.1%. A portion of the alloy specimens hardened from 800° in cold H<sub>2</sub>O, and a portion was annealed starting at 600° for 48 hrs. and ending at 180° for 94 hrs. On both the annealed and hardened specimens, Brinell hardness was det'd. The e.m.f.s. of a series of specimens were det'd. in a cell Cu/N CuSO<sub>4</sub>/Cu-Pd. This was done after 1, 2, and 3 anneals. Repeated annealing changed the shape of the curve, compa. to e.m.f. Furthermore, the e.m.f. was det'd. with annealed and hardened specimens in CuSO<sub>4</sub> and in HCl. Also studied was the anodic corr. of the alloys in CuSO<sub>4</sub> + H<sub>2</sub>SO<sub>4</sub>, 2N H<sub>2</sub>SO<sub>4</sub>, and 2N HCl. All alloys dissolved in HCl. In H<sub>2</sub>SO<sub>4</sub> and CuSO<sub>4</sub> + H<sub>2</sub>SO<sub>4</sub>, only alloys with up to 25 at. % Pd dissolved. M. Hovsh...

KLOCHKO, M.A.; KURBANOV, M.Sh.

Use of physicochemical analysis in the study of the system : phosphoric acid - water. Izv.Sekt.fiz.-khim.anal. 24:252-263 '54.  
(MIRA 8:4)

1. Institut obshchey i neorganicheskoy khimii im.N.S.Kurnakova  
Akademii nauk SSSR.  
(Phosphoric acid)

KLOCHKO, M.A.; KURBANOV, M.Sh.

Use of physicochemical analysis in the study of the system: sulfuric  
anhydride - water. Izv. Sekt.fiz.-khim.anal. 24:264-276 '54.  
(MIRA 8:4)

1. Institut obshchey i neorganicheskoy khimii im. N.S.Kurnakova  
Akademii nauk SSSR.  
(Sulfur trioxide)

Классика, МА.

U S R

General types of composition-property diagrams of binary  
metal phase systems. M. A. Krasnik, *Dokl. Akad. Nauk  
Khim. Nauk. Inst. Chim. Akad. Nauk S.S.S.R., Abstr. USSR  
S.S.S.R. 23, 82-83 (1954).*—A discussion. R. M.

KLOCHKO, M.A.; MIRONOVA, M.Ye.

Anodic solution of copper -- sulfur alloys. Izv.Sekt.fiz.-khim.anal.  
no.25:128-133 '54. (MIRA 8:5)

1. Institut obshchey i neorganicheskoy khimii im. N.S.Kurnakova  
Akademii nauk SSSR.  
(Copper-sulfur alloys)

~~GRINBERG~~ KLOCHKO, M. A.

GRINBERG, A.A. (Leningrad); BARAYEVA, A.V. (Moscow); YATSIMIRSKIY, K.B. (Ivanovo); GOREMYKIN, V.I. (Moscow); BOLIY, G.B. (Moscow); FIALKOV, Ya.A. (Kiyev); YAKSHIN, M.M. (Moscow); KEDROV, B.M. (Moscow); OHL'MAN, A.D. (Moscow); FEDOROV, I.A. (Moscow); MAKSIMTUK, Ya.A. (Leningrad); VOL'KINSHTEYN, M.V. (Leningrad); ZHDANOV, G.S. (Moscow); PTITSYN, B.V. (Leningrad); ABLOV, A.V. (Kishinev); VOLSHTEYN, L.M. (Dnepropetrovsk); TROITSKAYA, A.D. (Kazan'); KLOCHKO, M.A. (Moscow); BARAYEVA, A.V.; TRONEV, V.G. (Moscow); RUBINSHTEYN, A.M. (Moscow); CHERNYAYEV, I.I.; GRINBERG, A.A.; TANANAYEV, I.V.

Explanation of the transeffect. Isv.Sekt.plat.i blag.net. no.28:  
56-126 '54. (MLRA 7:9)

(Compounds, Complex) (Platinum)

KLOCHKO, M.A.

USSR.

Anodic behavior of silver-lead alloys in normal nitric acid.  
M. A. Klochkov and Z. S. Mikhaylova. Izv. Akad. Nauk SSSR, Ser. Khim., 1984, No. 3, 55-58, 55-56 (1984); in: C. S. S. R., 28, 510-7 (1984); in: C. S. S. R., 28, 510-7 (1984).—The anodic behavior of Ag-Pb and 14 intermediate alloys in  $N HNO_3$  at room temp. and a c.d. of 5 ma./sq. cm. was studied. All alloys were anode w.r. E.m.f. curves of Ag-Pb alloys in  $N Pt(NO_3)_3$  and  $N HNO_3$  had a sharp break at 3.3% Pb, indicating limit of solid sol. of Pb in Ag. H. W. Rathmann.

KLOCHKO, M.A.

USSR.

Anodic behavior of palladium-lead alloys in normal air is  
studied. M. A. Klochko and Z. S. Medvedeva. *Izv. Akad. Nauk S.S.S.R. Metal., (1971), (1971),  
Nauka Press, Moscow, U.S.S.R., 28, 208-72 (1971); J.  
C.I. 48, 9612d. — The anodic behavior of Pd, Pb, and  
alloys contg. 8.0, 21.3, 25.1, 30.8, 35.8, and 44.0 wt. %  
Pd was studied in  $N HNO_3$  at room temp. and at c.d. of 25  
ma./sq. cm. Alloys contg. 8.0-35.8% Pd dissolved in  $N HNO_3$ .  
 $E.m.f.$  curves in  $N Pt(NO_3)_4$  and  $N HNO_3$  had a  
break at 21.3% Pd, corresponding to the compd.  $Pt_3Pd$ .*

W. R. Matheson

KLOCHKO, N. A.

USSR

Anodic behavior of palladium in hydrochloric acid. N. A. Klochko, A. B. Shadrin, and M. K. Shadrin. *Electrochim. Acta*, 1964, 9, 10, 1041-1044. (Russian). -Anodic behavior of Pd in 0.1, 0.5, 1, 2, and 3 N HCl at room temp. was studied. Pd was passive in 0.1 and 0.5 N HCl and active in 1, 2, and 3 N HCl. A plot of potential of Pd were measured at various rates. J. W. R.

KLOCHKO, M.A.

Sergei Aleksandrovich Pogodin; on the 60th anniversary of his birthday.  
Izv.Sekt.fis.-khim.anal. 26:5-13 '55. (MLRA 8:9)

(Pogodin, Sergei Aleksandrovich, 1894- )  
(Bibliography--Chemistry)

KLOCHKO, M. A.

Anodic behavior of alloys of palladium-silver. M. A. Klochko and M. V. Mikheyev. *Fizich. Khim. i Nukl. Energ. Khim. Akad. Nauk S.S.S.R.* 13, 64-70 (1966). Anodic diss. of alloys of Pd and Ag in 2N H<sub>2</sub>SO<sub>4</sub> produced a large proportion of silver. Raising c.d. lowered yield of silver and increased amt. of Pd and Ag going into soln. Anodic soln. in 2N H<sub>2</sub>SO<sub>4</sub> at an anodic c.d. of 500 amp./sq. cm. caused 27-88% of Ag found in the anode to be oxidized and admitted into the electrolyte. Yield of silver represented 20-30% of anodic loss, whereas the alloys contained a lower percentage of Ag than the anode. Pd and Ag alloys had a greater anodic potential than did pure Pd. This was explained by the greater ease of transition of Pd into the electrolyte in the form of ions in comparison to decoupling of a sulfide and oxidation of S (1200 mv.). V. N. I.

①

Inst. Gen. & Inorganic Chem. in N.S. Kurnakov  
A.S. USSR



KLOCHKO, M. A.

✓ Anodic behavior of alloys of palladium and nickel. M. A. Klochko and Z. S. Medvedeva. *Izvest. Sibirsk. Fil. Khim. Akad. Nauk S.S.S.R.* 26, 63-66 (1964). -- The a.m.f. and anodic behavior of pure Ni and Pd and their alloys was detd. in H<sub>2</sub>-salt soln., in N HNO<sub>3</sub>, and in HCl. It was established that the relation of a.m.f. and anodic potential of annealed alloys of Ni and Pd to their compn. corresponded to the change of these properties in a continuous series of solid soln. In HNO<sub>3</sub> the alloys were passive but were anodically act. in HCl.  
V. N. Detmarch

(1)

KLochRo, M. A.

The anodic reduction and potentials of the platinum-  
copper alloys. M. A. Klochko and V. K. Nigmatov. *Zhurnal  
Fizicheskoi Khimii*, Moscow, U.S.S.R., 49, 2075 (1975).  
The electrochemical potentials, anodic anodic and the  
polarization curves of the Pt-Cu alloy system were measured  
over the whole range of composition both in the annealed  
and quenched states. The nature of changes in the  
potential curves (in 5N HCl and in 5N H<sub>2</sub>SO<sub>4</sub>) and the anodic  
currents depended strongly on the composition of the  
alloys in the solid state. The anodic current of the  
Pt-Cu alloys from a common anodic reaction was  
found on curves for quenched alloys. The anodic  
currents of Pt-Cu and Pt-Cu alloys were due to the  
alloys of these composition were the fastest removal from the  
equilibrium state, and therefore had a maximum free energy in com-  
parison with the annealed alloys of the same composition, which  
were true chem. compounds. The difference in the anodic  
potentials in the quenched and annealed states of the Pt-Cu  
alloys in 5N HCl reached 500 mV. The nature of anodic  
reduction was not affected by the thermal treatment. Under the  
influence of the elec. current, in alloys containing 10-20% Pt, the  
primarily entered the solid. In the middle part of the alloy  
with a Pt content between 20 and 40%, the anodic  
currents had the character of the alloy. Alloys with  
Pt were almost inert. The electrochemical potential measure-  
ments permitted the detection of chem. compounds in  
continuous series of solid alloys at lower temperatures than only  
on annealed samples but equally clearly in quenched samples.

2 3

PM

KLOCHKO, M.A.

Congress of Austrian and German chemists in Salzburg. Zhur.neorg.  
khim. 1 no.10:2430 O 56. (MIRA 10:1)  
(Salzburg--Chemistry--Congresses)

KLOCHKO, M.A.

~~Conference of Austrian and German chemists. Izv. AN SSSR, Otd. khim.~~  
bank no. 11:1426-1428 N '56. (MIRA 10:3)  
(Salzburg--Chemistry--Congresses)

KLOCHKO, M.A., doktor khimicheskikh nauk.

Conference of Austrian and German chemists. Vest. AN SSSR  
26 no.10:78-79 0 '56. (MLRA 9:11)

(Salzburg--Chemistry--Congresses)

Klochko, M.A.

Change of the bulk conductivity of molten lead  
chemical compounds and systems with temperature

Klochko, M.A. / Klovko, M.A. in

Ukrainian journal of physics

Vol. 10, No. 1, 1965

pp. 1-10

1965

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KLOCHKO, M.A.

Works of N.N. NIFREMOV in the field of electrochemistry. Izv. Sekt.  
fiz.-khim. anal. 27:28-29 '56. (MIRA 9:9)

1. Institut obshchey i neorganicheskoy khimii imeni N.S. Kurnakova  
AN SSSR.

(Electrochemistry) (Nifremov, Nikolai Nikolaevich, 1886-1947)

*KLOCHKO, M.A.*

USSR/Physical Chemistry - Solutions.  
Theory of Acids and Bases

B-11

Abs Jour : Referat Zhur - Khimiya, No 2, 1957, 3899

Author : Klochko M.A.

Inst : Institute of General and Inorganic Chemistry, Academy of  
Sciences USSR

Title : Changes in Electrolytic Conductivity of Individual  
Liquids and Solutions Depending on the Temperature.

Orig Pub : Izv. Sektora fiz.-khim. analiza IOMK AN SSSR, 1956, 27,  
50-74

Abstract : Subdivision of electrolytes into strong and weak is of  
limited utility. A more general subdivision is that of  
autolytes, which conduct the current in the liquid state,  
and heterolytes, which conduct the current only in  
solutions of suitable substances. The existing theories  
do not take into account the influence, upon conductivity,  
of thermal motion. In order to take this into

Card 1/2

- 167 -

KLOCHKO, M. A.

USSR/Physical Chemistry - Thermodynamics. Thermochemistry. B-6  
Equilibrium. Physico-Chemical Analysis. Phase Transitions

Abs Jour : Referat Zhur - Khimiya, No 2, 1957, 3729

Author : Klochko M.A., Medvedeva Z.B.

Inst : ~~Institute of General and Inorganic Chemistry, Academy~~  
of Sciences USSR

Title : Electrochemical Investigation of Silver-Tellurium Alloys

Orig Pub : Izv. Sektora fiz.-khim. analiza ICNAKh, AN SSSR, 1956, 27,  
133-140.

Abstract : Electrochemical investigation of eight Ag-Te alloys,  
over the component concentration range from pure Ag to  
37.2% by weight Te, corresponding to the composition of  
the compound Ag<sub>2</sub>Te. Electrolysis was carried out in 1  
N AgNO<sub>3</sub> acidified with 0.1 N solution of HNO<sub>3</sub>, with de-  
termination of electrode potential by comparison with  
a saturated calomel electrode. Investigated were the  
products of electrolysis -- sludge, electrolyte,

Card 1/3

- 75 -

Klochko, M.A.

Translation from: Referativnyy Zhurnal, Khimiya, Nr 2, p. 51 (USSR) 81-2-3759

AUTHORS: Klochko, M.A., Gubskaya, G.P.

TITLE: Electric Conductivity and Viscosity of the System  
Ammonium Nitrate-Acetamide (Elektroprovodnost' i  
vyazkost' sistemy nitrata ammoniya - atsetamid)

PERIODICAL: Izv. Sektora fiz.-khim. analiza IONKh AN SSSR, 1956, 27,  
pp. 393-401

ABSTRACT: Electric conductivity, viscosity, and density of the  
system  $\text{NH}_4\text{NO}_3$  (I) -  $\text{CH}_3\text{CONH}_2$  (II) have been investi-  
gated at 75, 125, and 175°C. It was found that variation  
in the conductivity is expressed by a marked rise, up to  
25-30 mol.% of I on the 125 and 175°C isotherms which  
corresponds to the hypoeutectic area on the state diagram.  
In the hypereutectic area the isotherms have a sloping  
shape. The viscosity curve for 175°C is slightly convex  
to the axis of the compound. The density values change  
almost linearly, increasing from II to I. The conduc-  
tivity temperature coefficients are hardly affected by

Card 1/2

*Klochkov, M. A.*

USSR/Thermodynamics. Thermochemistry. Equilibria. Physico-Chemical B-8  
Analysis. Phase Transitions

Abs Jour : Ref Zhur - Khimiya, No 8, 1957, 26162

Author : M.A. Klochkov, G.F. Gubskaya

Title : Electrical Conductivity and Viscosity of System Ammonium  
Nitrate - Water.

Orig Pub : Izv. Sektora fiz.-khim. analiza IONKh AN SSSR, 27, 402-411, 1956

Abstract : The electrical conductivity, density and viscosity of solutions of the system  $\text{NH}_4\text{NO}_3$  (I) -  $\text{H}_2\text{O}$  were measured at 25, 75 and 125° and the temperature factors of these properties were computed. The conductivity curves pass through a maximum at 18 to 20 mol. % of I. A shift of the maximum towards greater concentrations of I is observed at the temperature rise. Viscosity rises sharply with the rise of the I content in the solution. The curves of the temperature factors of conductivity pass through a minimum, and those of the viscosity pass through a maximum corresponding to the composition with the conductivity maximum which does not coincide with the eutectic composition. The appearance of the

Card : 1/2

*Inst. Gen. Inorganic Chem. N.S. Kurnakov*

*Electrochemical behavior of gold-copper alloys*

Distr: 4E4 4E20

*Electrochemical behavior of gold-copper alloys*  
 G. K. Kuznetsov and V. K. Nizhnik. *Russ. Rev. Phys. Chem.* 22, 1001 (1977), cf. U.S. 30, 000, 000. - The electrode potential  $E$  (mV), anodic only, and the polarization curves of Au-Cu alloys water quenched from 800° and others cooled at the rate of 100°/day to 600° and held at this temp. 1 day were detd. The  $R$  vs. compn. curves in 5N HCl and the  $R$  vs.  $E$  compn. curves in 5N HCl showed deep min. which in quenched alloys were attributed to higher free energy compared with those in annealed alloys. These min. corresponded to the compn. of the compounds AuCu, Au<sub>2</sub>Cu, Au<sub>3</sub>Cu, and Au<sub>4</sub>Cu. In alloys contg. from 1 to 30% Au, the Cu dissolved preferentially. Only Cu dissolved from AuCu<sub>3</sub>. With alloys contg. from 60 to 65% Au the proportion of Cu in the soln. was twice that in the initial alloy. In alloys contg. from 60 to 100% Au the compn. of the soln. approached that of the alloys. 1. Benignus

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2

~~KLOCHKO, M.A.~~  
KLOCHKO, M.A.; MIRONOVA, M.Ye. [deceased]

Studying anodic dissolution and potentials of copper-selenium  
alloys. Zhur.neorg.khim. 2 no.9:2235-2238 8 '57. (MIRA 10:12)  
(Copper-selenium alloys) (Electrolysis)

*KLOCHKO, M.A.*

KLOCHKO, M.A.

Maria Efimovna Mironova; obituary. Zhur. neorg. khim. 2 no.9:2239  
S 157.

(Mironova, Maria Efimovna, 1904-1957) (MIRA 10:12)

AUTHORS: Klochko, M. A., Gubskaya, G. F. SOV/78-3-10-24/35

TITLE: Investigation of the System Lithium Nitrate - Acetamide  
(Issledovaniye sistemy nitrata litiya-atsetamida)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1958, Vol 3, Nr 10, pp 2375-2381  
(USSR)

ABSTRACT: The system lithium nitrate - acetamide was investigated by the determination of the conductivity, viscosity and density, as well as by thermal analyses in order to ascertain the character of the chemical interaction between the components of the system. It can be seen from the phase diagram of  $\text{LiNO}_3\text{-CH}_3\text{CONH}_2$  that two compounds are formed in this system, which are  $\text{LiNO}_3 \cdot 2\text{CH}_3\text{CONH}_2$  and  $\text{LiNO}_3 \cdot \text{CH}_3\text{CONH}_2$ . The first eutectic point lies between 15-16 mol % lithium nitrate and 140°C. The conductivity was investigated in this system at 75, 125, 175 and 225°C. A maximum occurs in the isothermal lines at 75, 175 and 125°C. The viscosity and density were investigated in the temperature range of from 75 to 175°C. Some solutions have a considerable viscosity. The absolute value of the temperature coefficient of

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507/78-3-10-24/35

Investigation of the System Lithium Nitrate - Acetamide

conductivity is slowly increased. The isothermal lines of conductivity belong to the type 8, according to M. A. Klochko's classification. The eutectic area corresponds to the maximum of the isothermal lines of conductivity. There are 7 figures, 5 tables, and 5 references, 5 of which are Soviet.

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SUBMITTED: August 3, 1957

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**AUTHORS:** Klochko, M. A., Gubskaya, G. F. SOV/78-3-11-22/23

**TITLE:** The Conductivity and Viscosity of the Systems From Eutectic Mixtures of the Lithium- and Ammonium Nitrate With Acetamide or Water (Provodimost' i vyazkost' sistem iz evtekticheskoy smesi nitrato v litiya i ammoniya i atsetamida ili vody)

**PERIODICAL:** Zhurnal neorganicheskoy khimii, 1958, Vol 3, Nr 11, pp 2571-2581 (USSR)

**ABSTRACT:** The conductivity, viscosity, and density of the system lithium nitrate-ammonium nitrate was investigated at 125 and 175°C, and the property diagram of the system was constructed. The viscosity of the system increases with the increase in concentration of the higher melting component. The density changes almost linearly. The course of the conductivity curves shows that the conductivity curve of this system belongs to the type III. The system of the eutectic composition of lithium nitrate-ammonium nitrate-acetamide was investigated and plotted on the ternary diagram. The liquidus curve of the ternary system investigated consists of three parts. From the course of the conductivity isothermal lines may be concluded that the system ammonium nitrate-acetamide belongs to the second class according

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The Conductivity and Viscosity of the Systems From Eutectic Mixtures of the Lithium- and Ammonium Nitrate With Acetamide or Water

to the classification by M. A. Klochko. No great change of the volume occurs in the case of a formation of solid mixtures from the components in the ternary system lithium nitrate-ammonium nitrate-acetamide. The viscosity and density of the eutectic mixture lithium nitrate-ammonium nitrate-water was investigated.

There are 13 figures, 11 tables, and 19 references, 10 of which are Soviet.

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SUBMITTED: August 3, 1957

Card 2/2

KLOCHKO, M.A.

Conductivity of individual electrolytes and systems. Itogi  
nauki: Khim.nauki 4:6-47 '59. (MIRA 13:4)  
(Electrolytes--Conductivity)

5(2)

AUTHORS:

Klochko, M. A., Gubskaya, G. P.

SOV/78-4-3-29/34

TITLE:

On the Compounds of Lithium Nitrate With Acetamide  
(O soyedineniyakh nitrata litiya s atsetamidom)

PERIODICAL:

Zhurnal neorganicheskoy khimii, 1959, Vol 1, Nr 3,  
pp 684-687 (USSR)

ABSTRACT:

The crystallization of the compound  $\text{LiNO}_3 \cdot \text{CH}_3\text{CONH}_2$  from various solvents, e. g. acetone, benzene, ethyl alcohol, ether, and methyl alcohol was investigated. The compound can be crystallized in pure state and as uniform crystals only from acetone solution. In water at 25° the solubility of this compound amounts to 70.91 wt%. The compound is practically insoluble in benzene and nitrobenzene. The flat rhombic crystals have the following refraction indices:  $n_1=1.57-1.59$  and  $n_2=1.450$ .

It was not possible to isolate the compound  $\text{LiNO}_3 \cdot 2\text{CH}_3\text{CONH}_2$  in pure form from acetone, methyl alcohol, and ethyl alcohol. The existence of this compound was only found by thermal analysis, determination of the electric conductivity, and microscopic investigation. There are 1 figure, 2 tables, and

~~Cont-4/2~~

UDNEVA, M.M.; KLOCHKO, M.A.

Limits of homogeneity in water-dioxane and water-acetone systems  
with lithium, sodium, or potassium hydroxides at temperature of  
25 and 75°. Izv.Kar.i Kol.fil.AN SSSR no.5:122-129 '58.  
(MIRA 12'9)

1. Institut khimii i tekhnologii redkikh elementov i mineral'-  
nogo syr'ya Kol'skogo filiala AN SSSR.  
(Systems(chemistry))

5(2)

AUTHORS: Klochko, M. A., Godneva, M. M.

SOV/78-4-9-32/44

TITLE: The Study of the Electroconductivity and Viscosity of Aqueous Solutions of the Hydroxides of Sodium and Potassium

PERIODICAL: Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 9, pp 2127-2135 (USSR)

ABSTRACT: The numerous publications on the electroconductivity of solutions (Refs 1-18) contain only few data regarding electroconductivity in the case of higher concentrations and temperatures. The research workers mainly dealt with diluted solutions at low temperatures, among them M. I. Usanovich and T. N. Sushkevich (Ref 13), P. M. Korotkov and N. N. Sokolov (Ref 11), G. L. Kobus (Ref 14), M. G. Manvelyan (Ref 15), A. P. Skryshevskiy, A. V. Romanova, and V. I. Danilov (Ref 18). In some solvents there is a particular conductivity mechanism, e.g. if the components of a system possess common ions but differ with regard to the degree of dissociation. In aqueous solutions of acids and bases there is to be found, besides the transfer of electricity by the movement of ions along the lines of force of the field, yet another migration mechanism which causes the great mobility of the  $H^+$  and  $OH^-$  ions. In order to investigate the part played by water

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The Study of the Electroconductivity and Viscosity      SOV/78-4-9-32/44  
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in regard of this phenomenon the field of the transition from the pure molten electrolyte to compositions with a low water content had to be studied. It is intended to use an equimolar NaOH and KOH mixture melting at  $170^{\circ}$ . For the time being, however, an account of the measurement of the conductivity and viscosity of the two above components between 25 and  $200^{\circ}$  is given. The results are summarized in tables 2-7 and figures 3-7. The different conductivities of the aqueous solutions of the alkali hydroxides are due to the radius of the cation and the hydration. The small lithium ion is inhibited in its speed by a large hydrate shell. In melts and highly concentrated solutions hydration is limited, and the smaller ion reaches its respective greater velocity than a larger ion with the same charge. This change in hydration accounts for the fact that the conductivity  $\kappa_{\text{NaOH}}$  becomes greater at high temperatures than  $\kappa_{\text{KOH}}$ . The temperature coefficients of the viscosity  $\eta$  and conductivity  $\kappa$  change homologously (Fig 5),

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which also suggests a close connection between these properties. The polytherms of conductivity (Fig 6) become steeper as the concentration increases, which is due to the greater viscosity. A temperature increase is accompanied by a homologous drop of the product  $\kappa\eta$ . (Fig 7). There are 7 figures, 6 tables, and 23 references, 15 of which are Soviet.

SUBMITTED: January 17, 1959

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5(2)

AUTHORS: Klochko, M. A., Godneva, M. M.

SOV/78-4-9-33/44

TITLE: Electric Conductivity and Viscosity in the Transitional Region of the Melt of Sodium and Potassium Hydroxide and Their Aqueous Solutions

PERIODICAL: Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 9, pp 2136-2142 (USSR)

ABSTRACT: The melting point diagram of the system mentioned in the title (Fig 1) was investigated, inter alia, by V. A. Khitrov (Ref 4), G. M. Unzhakov (Ref 5), and N. A. Reshetnikov and G. M. Unzhakov (Ref 6). The authors had pointed to the role played by water in the so-called migration mechanism in connection with the investigation of concentrated aqueous solutions of hydroxides (Ref 1). This effect is now being investigated in the range of transition from the solution to the melt. An equimolar mixture of NaOH and KOH proved most favorable for such an investigation, since it melts at as low a temperature as 170°. For the purposes of this abstract this mixture will be referred to below as  $\text{MeOH} = \frac{\text{NaOH} + \text{KOH}}{2}$ . The measurement of the electric conductivity

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has already been described (Ref 1). The measurement of the viscosity was carried out at 125° by glass or quartz viscometers. For higher temperatures the method developed by R. S. Dantuma (Ref 7) proved impracticable on account of the formation of a crust. For this reason the rotation - vibration viscosimeter by Ye. G. Shvidkovskiy (Ref 8, Fig 2) was used. The results are shown in tables 1-3 and figures 3-9. (Table 1: electric conductivity of the system MeOH - water; Table 2: viscosity and density of this system; Table 3: temperature coefficient  $\alpha$  of the conductivity and temperature coefficient  $\beta$  of the viscosity as well as their relationship  $\gamma = \frac{\alpha}{\beta}$ ).

As is seen from figure 3, the conductivity  $\kappa$  of the solution passes through a maximum as the ion concentration increases, and then drops. Since, however, the descending branches are higher when the temperature is higher, it is assumed that there is a connection with viscosity  $\eta$  (Fig 4) and therefore a correction is made by the product  $\kappa\eta$  (Fig 5). The maxima of the  $\kappa\eta$  isotherms are attributed to the effect of the migration mechanism. At an increasing concentration the conductivity of the

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NaOH solutions exceeds that of the KOH solutions. This is attributed to the greater mobility of the Na ion due to the reduced hydration. The values for NaOH lie between those of NaOH and KOH. The conductivity of the electrolytes decreases as the temperature rises, which becomes apparent if the viscosity is not much influenced by temperature. M. A. Klovko explains this tendency toward a reduction of conductivity as a consequence of the increasing heat motion of the ions. There are 9 figures, 3 tables, and 14 references, 11 of which are Soviet.

SUBMITTED: January 17, 1959

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5(2)

SOV/78-4-10-27/40

AUTHORS:

Klochko, M. A., Godneva, M. M.

TITLE:

Electric Conductivity and Viscosity of Solutions of Lithium-, Sodium- and Potassium Hydroxide in Water - Dioxane Mixtures

PERIODICAL:

Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 10, pp 2347 - 2353 (USSR)

ABSTRACT:

Previous investigations (Refs 1,2) dealt with the electric conductivity and viscosity of aqueous solutions of NaOH and KOH and of their mixtures in order to determine both the influence exercised by concentration and temperature upon the migration mechanism of the ions and the concentration at which the inversion of conductivity of the K and Na ions occurs, i.e. at which the latter become more mobile than the potassium ions owing to the loss of the hydrate shell. Now the influence exerted by a non-aqueous component (dioxane) upon these processes is investigated. The system water - dioxane has been repeatedly investigated, also with respect to its conductivity  $\kappa$  (Refs 1-12, 14). In the experiments pure anhydrous dioxane was used and in the device according to P. P. Pugachevich (Ref 15) distilled water. The results are summarized in tables 1-4 and figures 2 and 3. If a part of the water molecules is replaced by dioxane, the conductivity decreases without any change of viscosity. This decrease is due to the missing of the migration mechanism of the ions as can also be seen from

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a comparison of the conductivity of KCl with KOH (Table 4).  
The maximum of viscosity at a dioxane content of 17-25 mole%  
indicates the formation of dioxane hydrates. The substitution  
of dioxane for water changes the hydration of the ions in a way  
that at 50 mole% inversion takes place and  $\kappa_{\text{NaOH}} < \kappa_{\text{KOH}}$ .  
There are 3 figures, 4 tables, and 16 references, 11 of which  
are Soviet.

SUBMITTED: January 17, 1959

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5(2)

SOV/78-4-10-28/40

AUTHORS: Klochko, M. A., Godneva, M. M.

TITLE: Electric Conductivity and Viscosity of Solutions of Lithium-, Potassium- and Sodium Hydroxide in Water - Acetone Mixtures

PERIODICAL: Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 10, pp 2354 - 2359 (USSR)

ABSTRACT: The effect of a non-aqueous solvent on hydration and migration mechanism of the electric conductivity of alkali hydroxides is investigated. The electric conductivity of electrolytes in water - acetone mixtures was also studied by S. V. Serkov (Ref 5). As can be seen from table 1 and figures 1 and 2, the electric conductivity decreases with increasing acetone content. The conductivities of KOH and NaOH approach to each other at increasing acetone content and increasing temperature, but more slowly than in water - dioxane mixtures. At 50 mole% acetone only the conductivities of NaOH and KOH are equal. The dehydrating property of acetone is less than that of dioxane, accordingly, and the elimination of the migration mechanism is attained more slowly. There are 4 figures, 3 tables, and 7 references, 5 of which are Soviet.

SUBMITTED: January 17, 1959  
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B004/B067

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AUTHORS: Klochko, M. A., Mikhaylova, M. P.

TITLE: Thermal Analysis of Systems Formed From Hydrazine With Acetone, Sulfur, and Lithium Chloride

PERIODICAL: Zhurnal neorganicheskoy khimii. 1960, Vol. 5, No. 10, pp. 2319-2324

TEXT: The authors describe an investigation of the electrical conductivity of systems, one component of which is hydrazine. To determine the conditions under which the components form homogeneous liquid phases, they studied the binary systems hydrazine - acetone, hydrazine - sulfur, hydrazine - hydrogen sulfide, and hydrazine - lithium chloride by thermal analysis. The system hydrazine - acetone was studied in the entire concentration range (Table 1, Fig. 1). Compound  $N_2H_4 \cdot 2(CH_3)_2CO$  with the melting point at  $-37.8^\circ C$  is formed. The crystallization temperature of the eutectics could not be exactly determined due to the high viscosity of the solutions. In the system hydrazine - sulfur (Table 2, Fig. 2),

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Thermal Analysis of Systems Formed From  
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Chloride

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S/O 78/60/005/010/015/021  
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compound  $N_2H_4S$  (melting point  $+15.0^\circ C$ ) is formed. The system has two eutectics, one at 33 mole% S (melting point  $-78.0^\circ C$ ) and the other at 65 mole% S (melting point  $-23.3^\circ C$ ). Since hydrogen sulfide is formed when adding sulfur to hydrazine, also the system  $N_2H_4 - H_2S$  was studied (Table 3, Fig. 3). Crystals having the composition  $3N_2H_4 \cdot 2H_2S$  are formed; they may be conserved only in  $H_2S$  atmosphere, and melt at  $+44.5^\circ C$ . A  $H_2S$  content higher than 41.8 mole% could not be obtained in this system. The eutectic with 21.0 mole%  $H_2S$  melts at  $-38.0^\circ C$ . The system  $N_2H_4 - LiCl$  was studied up to a content of 60 mole%  $LiCl$  (Table 4, Fig. 4). Compounds  $3N_2H_4 \cdot LiCl$  (melting point  $+58.7^\circ C$ ) and  $2N_2H_4 \cdot LiCl$  (melting point  $+115.0^\circ C$ ) are formed. The system shows three eutectics, one with 13.7 mole%  $LiCl$  (crystallization temperature  $-16.0^\circ C$ ), one with 29.5 mole%  $LiCl$  (crystallization temperature  $+45.5^\circ C$ ), and one with 39.0 mole%  $LiCl$  (crystallization temperature  $+67.0^\circ C$ ). There are 4 figures, 4 tables, and 10 references: 3 Soviet, 3 US, and 4 German. X

SUBMITTED: October 9, 1958

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S/078/60/005/010/016/021  
B034/B067

AUTHORS: Klochko, M. A., Batova, K. T.

TITLE: Solubility of the Fluorides and Iodides of Lithium and Cesium in Water and Some Other Solvents

PERIODICAL: Zhurnal neorganicheskoy khimii, 1960, Vol. 5, No. 10, pp. 2325-2328

TEXT: The authors wanted to study the relationship between solubility and other physical data, such as ionic radius and dielectric constant. The solubility of LiF, LiI, CsF, and CsI was determined at 25°, 50°, and 75°C in water, hydrazine, nitrobenzene, dioxane, toluene, and benzene, and at 0°, 25°, and 50°C in acetone. The experimental data for water are given in Table 1, those for the other solvents in Table 2. Table 3 shows the ratio  $r_k/r_a$  of the ionic radii for LiF, LiI, CsF, and CsI (according to A. F. Kapustinskiy). The solubility of these salts depends clearly on  $r_k/r_a$ . The more this ratio becomes equal to one, i.e., the more symmetric the configuration of the salt, the lower is its solubility in water. The symmetry of the salt is also significant for the solubility of

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Solubility of the Fluorides and Iodides of  
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Solvents

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B004/B067

nonaqueous solvents. In this case, however, the solubility decreases above all with the dielectric constant of the solvent. The exceptionally high solubility of CsI in hydrazine is probably due to the formation of a compound. The authors mention I. V. Tananayev et al. (Ref. 4). There are 3 tables and 11 references: 10 Soviet and 1 US. ✓

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Sciences USSR)

SUBMITTED: July 18, 1959

Card 2/2

KLOCHKO, M.A.; STEEL'NIKOV, A.A.

Electric conductivity and viscosity of the system ammonium nitrate -  
urea. Zhur. neorg. khim. 5 no.11:2483-2490 N '60. (MIRA 13:11)  
(Ammonium nitrate) (Urea)

KLOCHKO, M.A.; GUBSKAYA, G.F.

~~Study of the system silver nitrate - acetamide by methods of~~  
physicochemical analysis. Zhur. neorg. khim. 5 no.11:2491-2498  
N '60. (MIRA 13:11)

(Silver nitrate)

(Acetamide)

KLOCHKO, M.A.

Academician Nikolai Semenovich Kurnakov; on the one hundredth anniversary of his birth. Zhur. ob. khim. 30 no.11:3509-3513  
N'60. (MIRA 13:11)

(Kurnakov, Nikolai Semenovich, 1861-1941)

MEDVEDEVA, Z.S.; KLOCHKO, M.A.; KUZNETSOV, V.G.; ANDREYEVA, S.N.

Phase diagram of the system palladium-tellurium. Zhur.  
neorg. khim. 6 no.7:1737-1739 J1 '61. (MIRA 14:7)  
(Palladium) (Tellurium)

BELOV, A.I.; IVANOV, K.I.; KLOCHKO, N.A.; SIDOROV, S.P.; USPELOV, N.W.;  
YARMAK, M.F.

Ways of improving bits for BA-100 air percussion drilling rigs.  
Vzryv. delo no.46/3:232-238 '61. (MIRA 15:1)  
(Boring machinery)